

Chapter 2.4 POLLUTION PREVENTION (P2)

Recognized as the most cost-effective form of environmental protection, pollution prevention (or P2) is an environmental management strategy that emphasizes the elimination or reduction of wastes at the source of generation. Traditional waste management techniques, such as treatment and disposal concentrate on managing wastes after they are generated. Treatment, handling, and disposal of wastes result in significant financial costs and involve regulatory and compliance issues. In addition, traditional treatment processes of one waste stream often result in transferring contaminants to another that also must be managed (such as treating an air emission with a scrubbing operation which results in a wastewater stream).

Through P2 techniques, companies can eliminate or significantly decrease the quantity and/or toxicity of their generated wastes. Companies can avoid the direct costs and long-term liabilities associated with producing and managing those wastes. Source reduction techniques often result in increased production efficiencies which can decrease raw material purchasing needs. Also, P2 techniques emphasize a multi-media approach that avoids transferring contamination from one media to another.

Wastes are essentially wasted raw materials, and P2 efforts strive to conserve the use of raw materials by using them as efficiently as possible. P2 or source reduction is distinguished from recycling and reuse efforts, because these management techniques involve waste handling, collection, and reprocessing into a new raw material or useable product. True source reduction eliminates the need and the costs associated with wastes handling.

Goals of P2

- ⌄ Eliminate or reduce waste generation
- ⌄ Reduce the toxicity of generated wastes
- ⌄ Conserve natural resources and materials
- ⌄ Prevent spills and accidental releases
- ⌄ Prevent raw materials and product losses

P2 techniques are proactive approaches and solutions to waste management issues and problems. Categories include process efficiency improvements, materials substitution, inventory control, preventive maintenance, improved housekeeping, in-process recycling, and office waste reduction. These techniques may involve complex capital upgrades for new equipment and computerized automation of monitoring equipment. However, many P2 techniques are as simple as using less-toxic raw materials or changing certain facility procedures.

Categories of P2 Techniques

<u>Categories</u>	<u>Description</u>
Process Efficiency Improvements	Changes in process and/or equipment to produce less waste and use raw materials more efficiently.
Materials Substitution	Replacing hazardous chemicals with less toxic alternatives of equal performance.
Inventory Control	Reducing product losses due to product expiration and over-stocking; First-in, first-out and LIFO inventory control will reduce wastes and losses due to expiration and decomposition of containers.

Preventive Maintenance	Any activities that prevent equipment failures and environmental releases such as spills, leaks, and/or air emissions.
Improved Housekeeping	Keeping a clean shop helps conserve resources by preventing product losses due to spills and accidents.
In-Process Recycling	Materials that are redirected back into the production process.
Office Waste Reduction	Computer automation, use of 2-sided copies, and re-use of scrap paper reduces waste generation; use of energy efficient equipment reduces overall need for additional electricity generation which causes pollution.

Companies who utilize P2 approaches to waste management can realize the full costs associated with wasting by performing a waste assessment audit. Normal accounting procedures consider only the costs associated with disposal and possibly treatment. A waste assessment audit also considers the cost of raw materials wasted, the time associated with handling and environmental compliance, and long-term liability and coordination requirements. Once companies consider all of the costs associated with wasting, the financial benefits of pollution prevention projects often becomes clear.

☐ Reduced costs of:

- YWaste treatment and disposal
- YRaw materials purchases
- YProcess operations

☐ Meeting or exceeding environmental requirements

☐ Reduce potential environmental liabilities

☐ Protect employee health and safety

☐ Protect the environment

Most major industries with environmental staffs are aware of and have implemented pollution prevention techniques. In fact, industry has really been the driving force in promoting pollution prevention concept. These companies are realizing the benefits of P2 techniques and are using P2 to help their bottom lines and to gain a competitive advantage over other companies in their market. Many companies have been able to decrease their generation of hazardous and other wastes to such an extent that they can avoid environmental regulations and requirements altogether, resulting in significantly decreased long-term liabilities and expenditures. Other companies, however, especially small- to medium-sized companies, do not have trained environmental staff persons who are able to investigate P2 opportunities and industrial advancements.

DEQ's Office of Pollution Prevention

DEQ's Office of Pollution Prevention (OPP) is the state's central authority for pollution prevention techniques and is available to assist companies throughout the state. DEQ's OPP maintains a clearinghouse of resources and guidance materials specific to all industrial sectors and most business activities. OPP staff is also available to provide technical consultation and on-site assistance to business, industry, and government entities. OPP staff can also help develop educational materials and provide employee training at a given facility, and OPP consultation and assistance is non-regulatory and confidential. DEQ's OPP promotes P2 activities statewide by providing technical assistance, through outreach efforts, and various other initiatives.

Technical Assistance

OPP staff provides technical assistance to business, industry, government, and citizens. OPP

August 2000

maintains an information clearinghouse containing manuals, fact sheets, articles, success stories, and other resources on the most up-to-date P2 techniques and innovative products and approaches. In addition, the Internet provides access to an abundance of P2 information from other states and the federal government; and OPP's webpage provides access to many of its publications on-line (www.deq.state.va.us/opp). Upon request, OPP staff will research waste issues and/or problems and provide requestors with the information they need in a timely fashion.

OPP staff is also trained in performing on-site P2 opportunity assessments. These site visits are non-regulatory and confidential and can help companies identify potential solutions to their waste management problems. During site visits, OPP staff will tour the facility asking questions about production, the flow of raw materials, and other waste management issues in order to identify potential P2 opportunities.

After an assessment, OPP staff researches issues further and provides suggestions for reducing wastes. Companies are under no requirements to implement OPP suggestions, and some suggestions may require additional consideration and research by the company. Because the visits are strictly voluntary, the majority of OPP's suggestions are intended to save the company money while protecting the environment.

Outreach

DEQ's OPP conducts outreach activities to promote the use of P2 as the preferred solution to waste management problems. Outreach consists of training, presentations, publications, and the Internet homepage.

Teaching employees to consider and value P2 is one of the most effective ways of implementing a P2 program and continuing to find P2 solutions. Therefore, OPP is available to help companies provide P2 training and/or design on-site employee training programs. OPP also sponsors training workshops and conferences and makes presentations whenever requested to provide both general and technical information to various other audiences.

OPP publishes various fact sheets, success stories, and reports to provide guidance on issues that are relevant to Virginia businesses, government, and citizens. In addition, OPP publishes a quarterly newsletter entitled *Pollution Prevention Virginia*, which highlights companies who have successfully implemented P2, P2 products, and on-going projects by OPP and related programs. As mentioned, OPP's Internet webpage provides access to many of its clearinghouse resources, links to other P2 Internet information sources, and direct e-mail to OPP staff.

P2 Initiatives/Partnerships

Initiatives

DEQ's OPP pursues opportunities to support and co-sponsor initiatives which further pollution prevention ideals and activities. Recent initiatives include Businesses for the Bay, state agency P2 planning, regulatory integration, and environmental education.

In response to the Governor's emphasis on pollution prevention, and his long-term, voluntary goal of *Azero discharge* to the environment, DEQ formed the Division of Pollution Prevention & Compliance Assistance in July of 1997. This division contains the OPP, Small Business Assistance, SARA Title 3, Environmental Education, and Innovative Technologies programs. The following initiative, "VIP2", represents DEQ's comprehensive approach to the Governor's objectives, providing services and resources which enable real progress towards a long-term voluntary goal of *Azero discharge* to the environment. VIP2 also utilizes progress and resources that have been developed during past initiatives.

Virginia Innovations in Pollution Prevention (VIP2)

In April, 1999, the Secretary of Natural Resources formally announced the "Virginia Innovation in Pollution Prevention" or "VIP2" initiative. This initiative is based on the premise that the target for the next

August 2000

century must be to go beyond compliance with environmental regulation and move toward a sustainable economy of cleaner, more efficient technologies and operations. VIP2 consists of seven components designed to significantly expand the level of pollution prevention activity within the public and private sector, including the following:

- C **Environmental Excellence**, a public recognition program which recognizes environmental leadership in the development of environmental management systems (EMS) and environmental performance for industry and government;
- C **Mentoring**, a business-to-business mentoring network for pollution prevention, environmental management systems, and compliance;
- C **Environmental technology**, facilitating information transfer and implementation;
- C **Financial incentives** for pollution prevention and innovative technology investments;
- C **Integration** of opportunities for voluntary pollution prevention into environmental programs;
- C **Expanded technical assistance services** for pollution prevention and environmental management systems for Virginia facilities; and
- C **Environmental education** activities developed to integrate pollution prevention and innovative technology into Virginia school programs and general public outreach.

DEQ is moving forward with the implementation of VIP2, and it has formed workgroups consisting of stakeholders from industry, government, assistance organizations, and citizens groups. The **Environmental Excellence** program has been developed and will be implemented early in 2000. Networking of existing and developing **mentoring** programs, such as Businesses for the Bay, the Enviromentors program, and the Environmental Excellences EMS mentoring services is underway. Significant progress has been made in the areas of **environmental technology** and **financial incentives**. OPP received a special grant in 1998 to sponsor a formal **integration** project and consultants are currently working with DEQ central and regional staffs to build consensus and develop pilot projects. The full-time OPP staff was increased from three to ten, emphasizing **increased technical assistance**; and all of those positions should be filled by January 1, 2000. DEQ's **environmental education** program has expanded its focus and is helping to promote all aspects of VIP2.

Other Initiatives

State agency P2 planning is a result of the General Assembly's House Joint Resolution 453 (1995) requesting state agencies to consider and implement P2 practices when practical. DEQ coordinated a 3-year schedule of training, development and implementation of P2 plans for affected state agencies. In 1999, OPP hired a State Agency P2 Coordinator, who supports state agency initiatives and provides individual assistance. As a result, many agencies have made great strides in reducing their generation of waste streams while realizing cost savings.

Businesses for the Bay is a voluntary P2 initiative that is centrally coordinated by the EPA's Chesapeake Bay Program. Virginia's OPP and the state P2 offices from Maryland and Pennsylvania are promoting Businesses for the Bay as a program to encourage the reduced use of toxic chemicals and the generation of wastes. Program members annually make voluntary P2 commitments and report on their successes. The program also has created a business-to-business mentoring program to assist smaller companies in learning about P2 opportunities. Members receive periodic public recognition for their efforts and are eligible for various awards. To date, 155 Virginia businesses and government facilities have committed to the program and 70 individuals have volunteered as mentors. Two Virginia companies, Michelin in Scottsville and Siemens Automotive in Newport News, won the Businesses for the Bay Excellence Awards in the medium and large business categories. Denise Jeffries from the City of Newport News also won the program's Mentor-of-the-Year award.

Partnerships

August 2000

DEQ's OPP strives to maximize its own efficiency in promoting P2 activities by leveraging itself through various partnerships with other technical service providers. OPP works in partnership with groups such as the National Pollution Prevention Roundtable, the Elizabeth River Project, the Virginia Philpott Manufacturing Extension Partnership, and the Center for Innovative Technology (CIT) to fund and sponsor events such as regional conferences, workshops, and a P2 grants program. In addition, OPP is networked with technical assistance groups such as the Small Business Development Centers, DEQ's Office of Small Business Assistance, and university programs across the state.

P2 and Water Quality

In the case of water pollution, DEQ's OPP works with municipal pre-treatment programs and directly with business and industry to encourage the voluntary use of waste reducing techniques as a means to minimize the quantity and toxicity of wastewater discharges and to facilitate regulatory compliance. Instead of constructing treatment facilities and paying wastewater disposal fees, industrial facilities can implement source reduction measures that can eliminate or significantly decrease their wastewater discharges. DEQ's OPP works with DEQ regional pre-treatment inspectors to encourage such measures as potential solutions to permit compliance difficulties, offering mutual benefits to municipalities, businesses, and water quality.

Many facilities have successfully reduced discharge fees or avoided the construction of treatment facilities and individual discharge permits by implementing in-process water recycling systems. Facilities benefit from significantly decreased costs for water usage, as well as disposal cost, and some facilities have even achieved "near-zero" discharge through the use of "closed loop" systems. As a general rule, separation of waste streams is the most effective technique for reducing wastewater discharges because it creates opportunities for on-site, in-process recycling. Other effective measures include counter-current rinsing, increased automation to provide increased production efficiency, substitution of less toxic chemicals/materials, installation of leak detection systems, preventive maintenance, and improved inventory control.

Prior to making significant capital investment for treatment processes, businesses should contact DEQ's Office of Pollution Prevention to explore options which can avoid such expenditures and may improve the efficiency of a given facility. DEQ's OPP may be contacted at (804) 698-4235 or through the website www.deq.state.va.us/p2.